

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference NEC04P012		FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/JP2004/005997	International filing date (day/month/year) 26.04.2004	Priority date (day/month/year) 20.06.2003	
International Patent Classification (IPC) or national classification and IPC			
Applicant NEC CORPORATION			

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☒ (sent to the applicant and to the International Bureau) a total of 5 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input checked="" type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/005997

Box No. I

Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on translations from the original language into the following _____ which is the language of a translation furnished for the purposes of:
 - ☐ international search (Rule 12.3 and 23.1(b))
 - ☐ publication of the international application (Rule 12.4)
 - ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):
 - ☐ the international application as originally filed/furnished
 - ☒ the description:
 - pages 1-17 _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☒ the claims:
 - nos. 4-13, 16-20 _____ as originally filed/furnished
 - nos.* _____ as amended (together with any statement) under Article 19
 - nos.* 1-3, 21-32 _____ received by this Authority on 02.03.2005
 - nos.* _____ received by this Authority on _____
 - ☒ the drawings:
 - sheets 1-11 _____ as originally filed/furnished
 - sheets* _____ received by this Authority on _____
 - sheets* _____ received by this Authority on _____
 - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
 - ☐ the description, pages _____
 - ☒ the claims, nos. 14, 15 _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (specify): _____
 - ☐ any table(s) related to sequence listing (specify): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages _____
 - ☐ the claims, nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (specify): _____
 - ☐ any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application
- ☒ claims Nos. 4-8, 18-21, 25-32

because:

- ☐ the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international preliminary examination (*specify*):

- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. _____
are so unclear that no meaningful opinion could be formed (*specify*):

- ☐ the claims, or said claims Nos. _____ are so inadequately supported
by the description that no meaningful opinion could be formed.

- ☒ no international search report has been established for said claims Nos. 4-8, 18-21, 25-32

- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

- | | |
|----------------------------|--|
| the written form | <input type="checkbox"/> has not been furnished |
| | <input type="checkbox"/> does not comply with the standard |
| the computer readable form | <input type="checkbox"/> has not been furnished |
| | <input type="checkbox"/> does not comply with the standard |

- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

- ☐ See Supplemental Box for further details.

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-3, 9-13, 16, 17, 22-24	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-3, 9-13, 16, 17, 22-24	NO
Industrial applicability (IA)	Claims	1-3, 9-13, 16, 17, 22-24	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Document 1: JP 9-162402 A (Ricoh Co., Ltd.), 20 June 1997

Document 2: JP 11-289088 A (Matsushita Electronics
Industry Corporation), 19 October 1999

Document 3: JP 2002-231717 A (Texas Instruments, Inc.),
16 August 2002

Document 4: JP 10-303141 A (Sony Corporation), 13
November 1998

Document 5: JP 2002-368211 A (Toshiba Corporation), 20
December 2002, entire text; all drawings
(Family: none)

Document 6: JP 2003-37115 A (NEC Corporation), 7 February
2003, entire text; all drawings & US
2003/0022426 A1 & KR 2003010507 A & TW
548703 A

Document 7: JP 3-74878 A (Hitachi, Ltd.), 29 March 1991

Claims 1 to 3, 9 to 13, 16, 17 and 22 to 24

The inventions set forth in claims 1 to 3, 9 to 13,
16, 17 and 22 to 24 do not involve an inventive step in
the light of documents 1 to 6.

Document 3 sets forth a metal oxide film with a high
dielectric constant provided as a gate insulating film
via a silicon-containing insulating film, therefore it

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

would be easy for a person skilled in the art to apply the gate insulating film disclosed in document 3 as the gate insulating film in the invention set forth in document 1 (entire text; all drawings) and document 2 (paragraphs [0036] to [0058], [0080]; fig. 1, 2 and 6).

In addition, documents 4 to 6 set forth a feature wherein a sidewall comprising a silicon oxide film is formed via an insulating film comprising a silicon oxide film in order to prevent the occurrence of stress, and to prevent the occurrence of boundary levels by ensuring that a sidewall comprising a silicon nitride film does not come into direct contact with a semiconductor substrate. It would therefore be easy for a person skilled in the art to employ the feature of forming a silicon oxide film set forth in documents 4 to 6 before forming the silicon nitride film of the inventions set forth in documents 1 and 2.

Moreover, it was a known technique at the time of filing of this application to form an insulating film comprising a silicon nitride film on a metal oxide film with a high dielectric constant in order to prevent reactions between the metal oxide film with a high dielectric constant and the gate electrode.

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